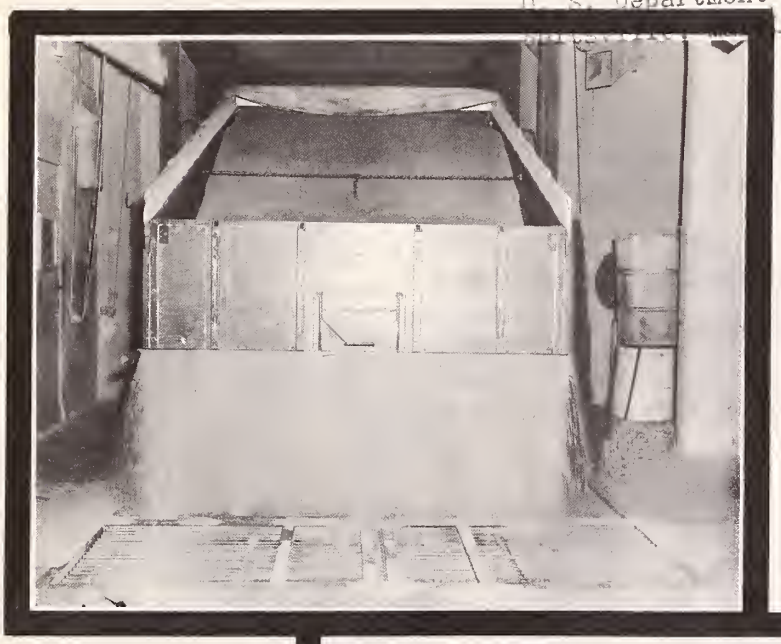


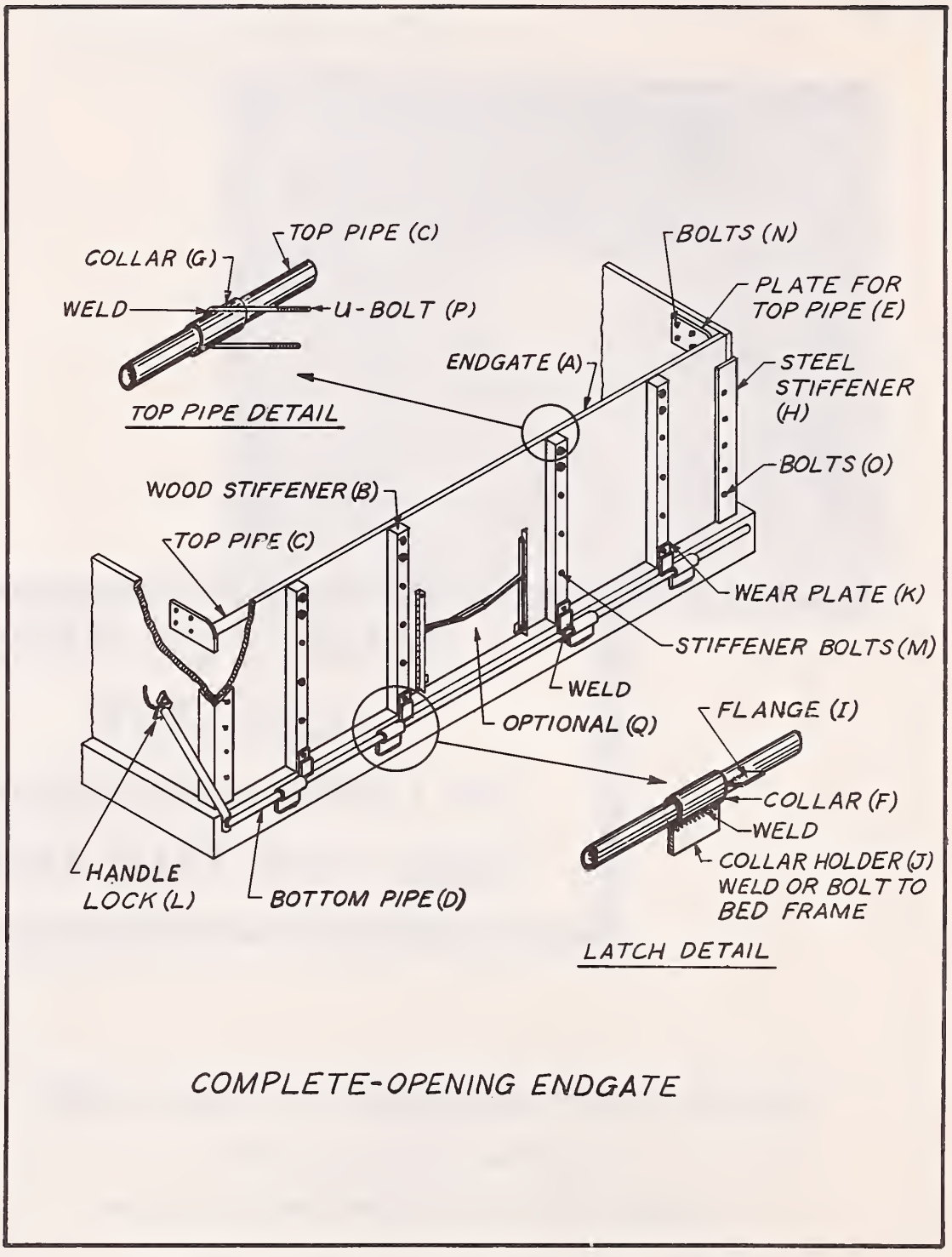
A COMPLETE-OPENING ENDGATE for faster unloading of grain from farm trucks

UNITED STATES DEPARTMENT OF AGRICULTURE

Agricultural Marketing Service

Transportation and Facilities Research Division

In Cooperation with Kansas Agricultural Experiment Station



COMPLETE-OPENING ENDGATE

Figure 1.--Detail of complete-opening endgate.
See page 6 for bill of materials.

A COMPLETE-OPENING ENDGATE FOR FASTER UNLOADING OF GRAIN FROM FARM TRUCKS

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A complete-opening, full-width endgate which permits faster unloading of grain from farm trucks at country elevators has been designed and tested by engineers of the Agricultural Marketing Service, U. S. Department of Agriculture.

The endgate, made of plywood, is hinged at the top and opens across the entire width of the grain body (see cover). A steel pipe at the botton, with flanges welded to it, serves as the latch. A small sliding gate may be purchased from a local farm supply dealer and built into the full-width endgate for use in unloading grain at the farm.

A 200-bushel standard farm truck equipped with a complete-opening endgate can be unloaded at an elevator in about 53 seconds, with no shoveling required. This is about twice as fast as when endgates with smaller openings are used that do require some shoveling of grain from the back corners of the truck. At harvest, when many loads of grain must be delivered to the elevator in a short time, time is expensive to both the farmer and the elevator operator.

The basic endgate is made from a 4- by 8-foot sheet of 3/4-inch exterior-grade plywood (fig. 1). The endgate can be fitted by standing the sheet of plywood on edge on the grain bed at the rear of the grain body and holding it against the sides of the body. With the body sides held vertical, the plywood is marked and cut to exact size. This method can be used for virtually every type of grain body.

The hinge is made from 1½-inch extra-heavy steel pipe, with four 2-inch pipe collars and four U-bolts around the collars, spaced along the pipe opposite four vertical wood stiffeners, as shown in figure 1. The pipe, with collars in place and a plate welded to each end, is extended across the top of the grain body and bolted in place. The

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U-bolts are used to fasten the collars to the four stiffeners of the endgate. The U-bolts should be permanently joined to the collars by welding. When the endgate is not needed, the bolts in the plate at each end of the top pipe are removed and the endgate is lifted out.

Four 2- by 2-inch wood stiffeners are bolted in a vertical position on the outside of the endgate. The two center stiffeners should be spaced to permit installation of a small sliding gate if desired. A 1½-inch by 3-inch steel plate should be bolted to each stiffener at the bottom outside edge to serve as a "wear point" for the latch.

Steel angles (3/16 by 3 by 2 inches) are bolted on the ends of the endgate, spaced to overlap the sides of the grain body on the outside. Their purpose is not only to eliminate grain leaks but also to stabilize the sides of the grain body when it is empty. These angles also prevent damage to the endgate when it is not in place on truck.

The endgate latch is made from a 1-inch, extra-heavy, steel pipe cut to the width of the endgate. A handle is made by welding a 1-foot length of the same material at right angles to the pipe at its left end.

BN-18650

Figure 2.--Latch handle open, releasing bottom of endgate.

To hold the pipe in place, four collars, each 6 inches long, are cut from 1¼-inch standard steel pipe and welded to plates which in turn are bolted and welded to the end of the truck bed. The 1-inch pipe is slid through the collars and then 3- by 2-inch plates are welded to the pipe (fig. 2). These plates serve as fasteners which press against the wear plates of the stiffeners and hold the endgate closed when the handle is pulled tight; they should be alined with the stiffeners before being welded.

The last part to be installed is a handle lock--a bent steel plate, bolt, and chain, attached to the left side of the grain body (fig. 3). A hole is drilled through the plate so the endgate will be tightly closed when a 1/2-inch bolt is dropped through the plate into the end of the latch handle.

Estimated cost of materials to build the endgate, exclusive of the small sliding gate, was $23 in early 1963.

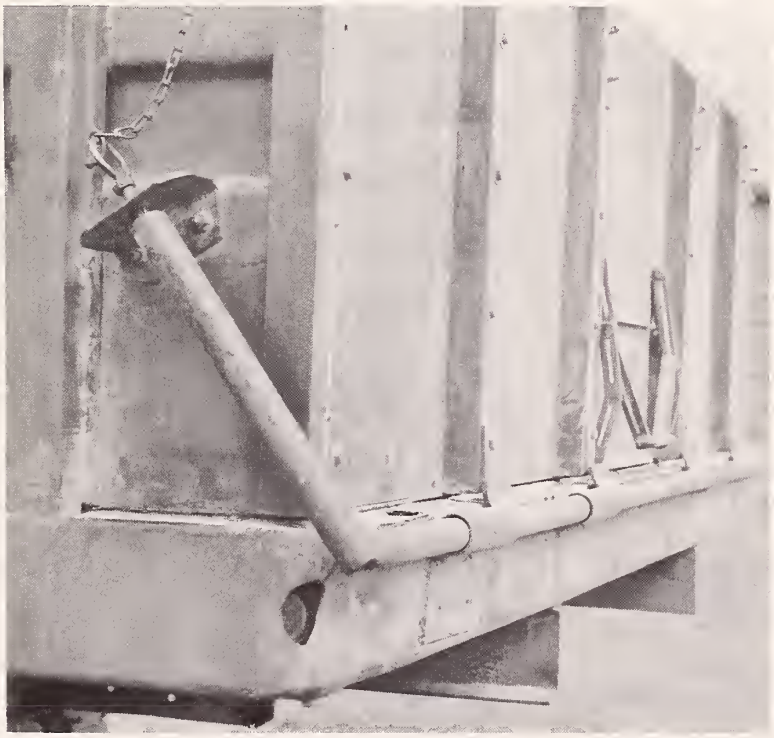

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Figure 3.--Latch handle in closed position, locked with bolt and ring.

BILL OF MATERIALS

Part No. on Fig. 1	Description	Material	Number of pieces and size	
			Number	Inches
A	Endgate	Fir plywood, exterior grade	1	1/ 48 x 96 x 3/4 thick
B	Stiffener	Fir lumber	4	1/ 2 x 2
C	Top pipe	Extra-heavy steel pipe	1	1/ 1½ diameter
D	Bottom pipe and handle	Extra-heavy steel pipe	1	1/ 1 diameter
E	Plate for top pipe	Steel plate	2	4x8x¼ thick
F	Collar for bottom pipe	Standard steel pipe	4	6x1¼ diameter
G	Collar for top pipe	Standard steel pipe	4	2 x 2 diameter
H	Stiffener	Steel angle	2	1/ 3x2x3/16 thick
I	Flange	Steel plate	4	3x2x3/16 thick
J	Bottom collar holder	Steel plate	4	6x4x3/16 thick
K	Wear plate	Steel plate	4	3x1½x3/16 thick
L	Handle lock	Bent steel plate with chain and bolt	1	To fit handle
M	Bolts for wood stiffener	Carriage bolt with 2 flat, 1 lock washer	16	4x3/8 diameter
N	Bolts for top pipe to body side	Machine bolt with washer	8	1½x3/8 diameter
O	Bolts for steel stiffener to endgate	Carriage bolt with washer	10	2x3/8 diameter
P	Bolts for top pipe to endgate	U-bolt with washers	4	5x3/8 diameter with 2" spread

1/ Plywood is cut to fit truck body and length or width of other footnoted items is determined accordingly.